

REMARKS

In the outstanding final Office Action¹, the Examiner rejected claims 14-20, 24-27, and 29 under 35 U.S.C. § 112, first paragraph; rejected claims 14-20, 24-27, and 29 under 35 U.S.C. § 112, second paragraph; rejected claim 14 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,619,680 to Nourshargh et al. ("Nourshargh") in view of U.S. Patent No. 6,117,345 to Liu ("Liu") and U.S. Patent No. 6,154,582 to Bazylenko ("Bazylenko"); rejected claims 15-17, 24-26 and 29 under 35 U.S.C. §103(a) as being unpatentable over Nourshargh in view of Liu and Bazylenko as applied to claim 14, and in further view of U.S. Patent No. 3,850,604 to Klein ("Klein"); rejected claims 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Nourshargh in view of Liu, Bazylenko, and Klein, and in further view of U.S. Patent No. 4,915,810 to Kestigian ("Kestigian"), and rejected claim 27 under 35 U.S.C. § 103(a) as being unpatentable over Nourshargh in view of Liu and Bazylenko as applied to claim 14, and in further view of U.S. Patent No. 6,615,614 to Makikawa ("Makikawa").

By this amendment, Applicants have amended claims 14, 18, and 29. Claims 14-29 remain pending in this application, with claims 14-20, 24-27, and 29 currently presented for examination.

I. Objection to the Information Disclosure Statement

Regarding the objection to the Information Disclosure Statement (IDS), the Examiner asserts that the IDS filed October 19, 2006 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the dates of publication for at least one non-patent document is not provided. Although Applicants note that the exact date is not required as long as an initial prior art determination can be made (*see* MPEP § 609, 8th Ed., Rev. 5 (August, 2006)), in the

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement of characterization in the Office Action.

attached IDS, Applicants have included an updated Form PTO/SB/08 including at least the month and year of the publications, where possible.

The Examiner also asserts that the IDS filed March 19, 2007 fails to comply with 37 CFR 1.97(c) because it lacks a statement as specified in 37 CFR 1.97(e). In response, Applicants have included the attached IDS, filed under 37 C.F.R. § 1.97(b), which does not require a statement under 37 C.F.R. § 1.97(e). Accordingly, Applicants respectfully request that the Examiner assist Applicants in fulfilling their duty of disclosure, and consider these documents and indicate that they were considered by making the appropriate notations on the attached corrected Forms PTO/SB/08.

II. Rejection under 35 U.S.C. § 112, first and second paragraphs

Regarding the rejection of claims 14-20, 24-27, and 29 under 35 U.S.C. § 112, first and second paragraphs, the Examiner first asserts that there is “no support for the newly claimed limitation that the core layer completely covers the entire area.” Office Action, page 3. The Examiner further asserts that there is no antecedent basis for “the entire are,” and that “there is no indication as to what this entire area might be.” Office Action, page 4.

Although Applicants disagree with the Examiner’s assertions, Applicants have amended claims 14, 18, and 29 in an attempt to expedite prosecution. Specifically, claims 14, 18, and 29 have been amended to recite “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure.” Support for this amendment may be found in Applicants’ specification at, for example, paragraphs [0023] and [0038]. Specifically, paragraph [0023] states “[c]ore layer 20 covers the top surface of ridge structure 11, the sidewall 12 of structure 11 and the horizontal surfaces between structure 11” (emphasis added), and paragraph [0038] states “ridge structure 11P is continuously covered with core material including core layer 22, sidewall layer 20B, and slab

portion 25.” Support is further found in Applicants’ FIGS. 1C and 4B. As shown in FIG. 1C, the claimed “core layer” 30 is deposited such that the “entire surface” of claimed “ridge portion” 16, claimed “sidewall portion” 12 and claimed “planar portion” 14 of claimed “ridge structure 11 is “completely and continuously cover[ed].”

Applicants have thus demonstrated that amended claims 14, 18, and 29 are fully described and sufficiently defined in the specification and the drawings of this application. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 14, 18, and 29 under 35 U.S.C. § 112, first and second paragraphs.

III. Rejections under 35 U.S.C. § 103(a)

Applicants traverse the rejection of claims 14-20, 24-27 and 29 under 35 U.S.C. § 103(a), because a *prima facie* case of obviousness has not been established. To establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See* MPEP § 2142, 8th Ed., Rev. 5 (August 2006). Moreover, “in formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.” USPTO Memorandum from Margaret A. Focarino, Deputy Commissioner of Patent Operations, May 3, 2007, page 2.

In examining the claims, the Examiner asserts that the limitations of at least independent claims 14, 18, and 29 have been interpreted to have “the broadest reasonable interpretation in [its] ordinary usage in context...” Office Action, page 5. The Examiner further asserts that because “[t]here is no definition, disclosure or description of the claimed ‘entire area’ or ... ‘ridge portion’, sidewall portion’ and ‘planar portion,’ that “it is deemed that the claimed areas can be portions of any size, however small, and of any shape - and that there need not be any boundaries thereto - physical or otherwise.” Office Action, pages 5-6. The Examiner then

concludes that “‘ridge portion’ encompasses any portion ... of a ridge,” “‘sidewall portion’ encompasses any portion ... of a sidewall,” and “‘planar portion’ encompasses an portion ... of the plane.” *Id.* Applicants respectfully disagree with the Examiner’s assertions and conclusion.

Claims 14, 18, and 29 specifically recite “a ridge structure having a ridge portion, a sidewall portion, and a planar portion.” That is the claimed “ridge structure” has “a ridge portion,” “a sidewall portion,” and a “planar portion.” In other words, the claimed “ridge portion” does not refer to any ridge portion, as asserted by the Examiner, but rather the ridge portion of the claimed “ridge structure.” Similarly, the claimed “sidewall portion” is the sidewall portion of the claimed “ridge structure,” and the claimed planar portion is the planar portion of the claimed “ridge structure.”

Moreover, these specific portions of the claimed “ridge structure” are clearly defined in Applicants’ specification and figures. For example, as shown in FIG. 1C of Applicants’ Figures, and described in at least paragraph [0023] of Applicants’ specification, the claimed “core layer” 30 is deposited such that the “entire surface” of claimed “ridge portion” 16 of ridge structure 11, claimed “sidewall portion” 12 of ridge structure 11, and claimed “planar portion” 14 of claimed “ridge structure 11, is “completely and continuously cover[ed].”

The Examiner further notes that “[a]s seen by applicant’s figure 4A, part of sidewall is exposed, and thus is not completely covered.” Office Action, page 6. Applicants note that Fig. 4A is directed to an embodiment provided for illustrative purposes, and not the claimed embodiment.

For at least the foregoing reasons, Applicants respectfully submit that the Examiner’s interpretation of the claim elements is inconsistent with the specification, drawings, and the claims themselves, and is also not consistent with standard examining procedure. Accordingly, Applicants respectfully traverse the rejections because, no *prima facie* case of obviousness can

be established for at least the reasons that the references, in combination, fail to teach or suggest each and every element of the claims, as discussed below.

A. Claim 14

Regarding the rejection of claim 14 under 35 U.S.C. § 103(a), Nourshargh fails to teach or suggest a combination including at least “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in amended claim 14 (emphasis added). Nourshargh fails to teach or suggest at least this element.

Nourshargh teaches in Figs. 2(b) and 2(c), for example, a waveguide including a substrate 11, a groove 13, and a core glass 14. To the extent that top elevated surface of substrate 11, groove 14, and the vertical surface therebetween can reasonably be construed as respectively corresponding to Applicants’ claimed “ridge portion,” “planar portion,” and “sidewall portion,” Fig. 2(c) clearly shows that “the entire surface” of vertical surface between top elevated surface of substrate 11 and groove 13 is not “completely and continuously cover[ed]” by core glass 14.

Moreover, Nourshargh teaches:

the desired waveguide pattern is first written on a substrate 11 using photolithography ... core glass 14 is deposited on the substrate ... and by suitably controlling the amount of dopant in the core glass as the dopant in the core glass as the deposition process is carried out, it may have any desired refractive-index profile across its thickness which is less than the depth of the grooves 13 so that the waveguide is fully embedded within the grooves 13. Nourshargh, col. 2, lines 7-28 (emphasis added).

Thus, as further shown in Fig. 2(c), since the thickness of the core glass 14 is less than the depth of the grooves 13, core glass 14 does not “completely and continuously cover[] the entire surface” of vertical surface between top elevated surface of substrate 11 and groove 13.

Nourshargh thus fails to teach or suggest a combination including “completely and continuously

cover[] the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in claim 14 (emphasis added).

Liu fails to cure the deficiencies of Nourshargh. Liu generally teaches “[a] method for depositing dielectric material into gaps between wiring lines in the formation of a semiconductor device.” Liu, abstract. Liu, however, is silent as to at least a “core layer,” and thus cannot teach or suggest a combination including at least “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in amended claim 14.

Bazylenko fails to cure the deficiencies of Nourshargh and Liu. Bazylenko teaches “[t]he core layer is then chemically etched (FIG. 10b) to produce a chemically etched step profile 19A.” Bazylenko, col. 9, lines 61-62. That is, Bazylenko teaches forming a core layer, and then etching a portion of the core layer. Because Bazylenko teaches removing a portion of the core layer, the core layer of Bazylenko cannot “completely and continuously cover[] the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in claim 14 (emphasis added).

For at least the reason that references, whether taken alone or in combination, fail to teach or suggest every element recited in claim 14, a *prima facie* case of obviousness cannot be established with respect to claim 14. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 14 under 35 U.S.C. § 103(a).

B. Claims 15-17, 24-26 and 29

Claims 15-17, and 24-26 depend from claim 14, and thus require all of the elements recited in claim 14. As discussed above, Nourshargh in view of Liu and Bazylenko fails to teach or suggest every element recited in claim 14. Accordingly, these references also fail to teach or suggest every element required by dependent claims 15-17, and 24-26.

Klein fails to cure the deficiencies of Nourshargh, Liu, and Bazylenko. Klein teaches a general method for sputtering a target using, for example, an RF discharge. Klein, col. 4, lines 3-15. Klein, however, fails to teach or suggest at least the element, “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in amended claim 14, and required by dependent claims 15-17 and 24-26.

For at least the reason that the references, whether taken alone or in combination, fail to teach or suggest every element required by claims 15-17 and 24-26, a *prima facie* case of obviousness cannot be established with respect to claims 15-17 and 24-26. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 15-17 and 24-26 under 35 U.S.C. § 103(a).

C. Claim 29

Claim 29, as amended, contains elements similar to those recited in claim 14. For example, claim 29 recites a combination including at least “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as also recited in amended claim 14, and required by claims 15-17 and 24-26. As discussed above, neither Nourshargh, nor Liu, nor Bazylenko, nor Klein teach or suggest at least this element.

Therefore, for at least the reason that the references fail to teach or suggest every element recited in claim 29, a *prima facie* case of obviousness cannot be established with respect to claim 29. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 29 under 35 U.S.C. § 103(a).

D. Claims 18-20

Claim 18 recites a combination including at least “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” As discussed above, neither Nourshargh, nor Liu, nor Bazylenko, nor Klein teach or suggest at least this element.

Kestigian further fails to cure the deficiencies of Nourshargh, Liu, Bazylenko, and Klein. Kestigian teaches a method for forming targets for use in ion beam sputtering. Kestigian, abstract. Kestigian’s method involves the formation of targets wherein plugs with different compositions can be inserted into a plurality of holes formed in the target. *Id.* at col. 3, lines 12-25. Kestigian, however, does not teach or suggest the formation of waveguides or core layers. Thus, Kestigian fails to teach or suggest at least a combination including, “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in amended claim 18.

For at least the reason the references, whether taken alone or in combination, fail to teach or suggest every element recited in amended claim 18, a *prima facie* case of obviousness has not been established with respect to claim 18. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 18 under 35 U.S.C. § 103(a).

Claims 19 and 20 depend from claim 18, and thus require all of the elements recited in claim 18. Because Nourshargh, Liu, Bezylenko, Kestigian, and Klein fail to teach or suggest every element recited in claim 18, that combination of references also fails to teach or suggest

every element required by dependent claims 19 and 20. Accordingly, a *prima facie* case of obviousness cannot be established with respect to claims 19 and 20. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of claims 19 and 20 under 35 U.S.C. § 103(a).

E. Claim 27

Claim 27 depends from claim 14, and thus requires all of the elements of claim 14. As discussed above, neither Nourshargh, nor Liu, nor Bazylenko, nor Klein teach or suggest at least a combination including “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in amended claim 14 and required by claim 27. Makikawa fails to cure the above-noted deficiencies of these references.

Makikawa generally discloses a method for preparing an optical waveguide substrate. As shown in FIG 1 (c)-(d), Makikawa teaches depositing a core layer 14 in grooves 12, and over oxidized substrate 13. Makikawa further teaches, however, that:

the surface of the resulting structure is abraded off until the substrate is exposed and a flat surface is defined ... [a]brasion is preferably continued until the buried portions of the core film are abrade several microns. This results in the substrate in which the core film segments 14 and the under clad film 13 are present on the same substrate surface. Makikawa , col. 3, lines 34-46.

Accordingly, this cannot constitute a teaching of “the core layer completely and continuously covers the entire surface of the ridge portion, the sidewall portion, and the planar portion of the ridge structure,” as recited in claim 14 and required by claim 27.

For at least the reason that the references, whether taken alone or in combination, fail to teach or suggest each and every element required by claim 27, the Examiner has failed to

establish a *prima facie* case of obviousness. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claim 27 under 35 U.S.C. § 103(a).

In view of the foregoing amendments and remarks, Applicants submit that this claimed invention, as amended, is not rendered obvious in view of the prior art references cited against this application. Applicants therefore request the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

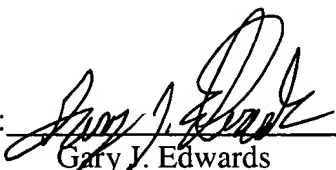
Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: August 9, 2007

By: _____


Gary J. Edwards
Reg. No. 41,008

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